

WHAT IS CLAIMED IS:

5 1. A partial stroke testing system for online testing  
of emergency shut-off valve, said system implemented on an  
emergency shut-off valve normally movable between fully open  
and fully closed position, control means for initiating an electrical  
signal for initiating a test, a source of pressurized gas and means  
including a main solenoid , a main solenoid valve quick exhaust  
10 valve and a pneumatic actuator for opening and closing the said  
shut off valve, test means for testing the said emergency shut-off  
valve , test means for testing the said emergency shut-off valve  
without fully closing the emergency shut-off valve in response to  
a signal from the said control means, said test means including a  
15 second solenoid , a second solenoid valve for bleeding off  
pressurized gas to thereby move said emergency shut-off valve  
from full opened position to partially closed position, means for  
limiting the movement of said emergency shut-off valve to a  
partially closed position as a result of the bleeding off of  
20 pressurized gas and means for detecting actual movement of  
said emergency shut-off valve.

25 2. A partial stroke testing system for online testing  
of emergency shut-off valve according to claim 1, which includes  
a second solenoid valve (PITT solenoid valve) for bleeding of  
pressurized air to thereby close said emergency valve to partial  
limit.

30 3. A partial stroke testing system for online testing  
of emergency shut-off valve according to claim 2 , which includes  
an isolation valve between said second solenoid valve said

pneumatic actuator for isolating the said second solenoid valve from the rest of the system.

5                   4.    A partial stroke testing system for online testing of emergency shut-off valve according to claim 1, which includes control sequence programmed into the plant emergency shutdown system controller which acts as control means for initiating partial stroke test on said shut-off valve.

10                   5.    A partial stroke testing system for online testing of emergency shut-off valve according to claim 1, in which the means for detecting the movement of the said emergency shut-off valve is a limit switch.

15                   6.    A partial stroke testing system for online testing of emergency shut-off valve which includes a partial stroke limit switch to indicate the partial valve closure during the test of an emergency shut off valve.

20                   7.    A partial stroke testing system for online testing of emergency shut-off valve according to claim 2, which bleeds pressurized gas from the shut-off valve actuator during partial stroke checking of emergency shut-off valve.

25                   8.    A partial stroke testing system for online testing of emergency shut-off valve according to claim 4 , in which backup means for terminating the partial stroke test is the timer programmed in to the plant emergency shutdown system controller.

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5 9. A partial stroke testing system for online testing of emergency shut-off valve according to claim 2, which bleeds pressurized air from the system during emergency closure (trip) of the said emergency shut-off valve to enhance the bleed rate and act as a backup to the main solenoid valve and quick exhaust valve in the event of unsafe failure of the said main solenoid valve and quick exhaust valve.

10 10. A partial stroke testing system for online testing of emergency shut-off valve according to claim 2, which includes means of monitoring the full stroke travel time of said emergency shut-off valve in the event of emergency closure of the said emergency shut-off valve as a result of a trip signal from the plant emergency shutdown system controller.

15 11. A partial stroke testing system for online testing of emergency shut-off valve according to claim 2, which includes means preventing inadvertent manual opening of the said emergency shut-off valve, subsequent emergency closure of the said emergency shut-off valve as a result of a trip signal from the plant emergency shutdown system controller and prior to reset of trip signal in the plant emergency shutdown system controller.

20 12. A partial stroke testing system for online testing of emergency shut-off valve according to claim 2, which includes means for initiating partial stroke test manually or at programmed intervals from a computer interfaced to plant emergency shutdown system controller and to generate printed report of test results.

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13. A partial stroke testing system for testing of emergency shut-off valve according to claim 2, which can be implemented as a portable and self contained test apparatus for conducting partial stroke test on shut-off valves controlled by non-programmable shutdown system

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